Product Engineering Guide

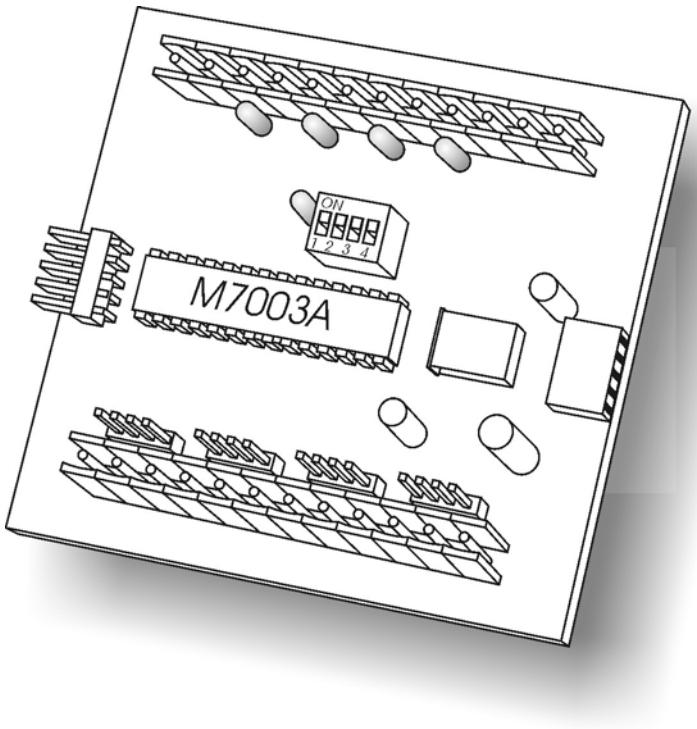
ZIP Module 7003A

Introduction

With the decrease of large programmable controllers and the increase of ‘fixed function’ controllers being used in buildings there is a growing need for a cost effective way of picking up extra inputs and outputs. ZiP is a modular data acquisition system. It is designed to operate either within a control panel or stand-alone.

A ‘ZIP System’ is a collective term for the connection of ZIP Modules, ZIPNet, and a ZIPMaster. The ZIP Modules link together in a ‘daisy chain’ style using PowerZIP connectors. A module available for ‘daisy chaining’ is the M7003A.

ZIP M7003A



(79mm x 72mm)

The ZIP M7003A is a 4 digital-input, 4 analogue-input module. It has male and female Power ZIP connectors, and can be connected to any device that has a female PowerZIP connector, for example a ZIP NetCard. The digital-inputs are designed to be connected to any type of volt-free switch. Each analogue input can be configured to read 0-20mA, 0-5VDC or 0-10VDC. The module processes the data from each input through a12-Bit analogue to digital converter.

With the module connected and power running through the module the green LED beside the Address Switch should be permanently on or flashing. The flashing shows the module is working properly, and as soon as the master has started to communicate with the module the LED will remain continuously lit.

Engineering

Step 1 – Power down ZIP System

Before connecting the ZIP Module to a female PowerZIP connector, the device that has the female PowerZIP connector needs to have its power disconnected.

Step 2 – Set the ZIP Module's Address

Set the ZIP Module's unique address using the Address Switch. The address of a module must be in the range of 0-15.

Step 3 – Connect ZIP Module

Using the male PowerZIP connector, connect to the female PowerZIP connector on either a ZIPNet network card or to another ZIP Module.

Step 4 – Configure the Analogue Inputs

Using the jumpers provided configure the type of measurement to be used on each analogue Input. This can be 0-20mA, 0-5V or 0-10V. See section '***Analogue Inputs***'

Step 5 – Connect Sensors and Actuators

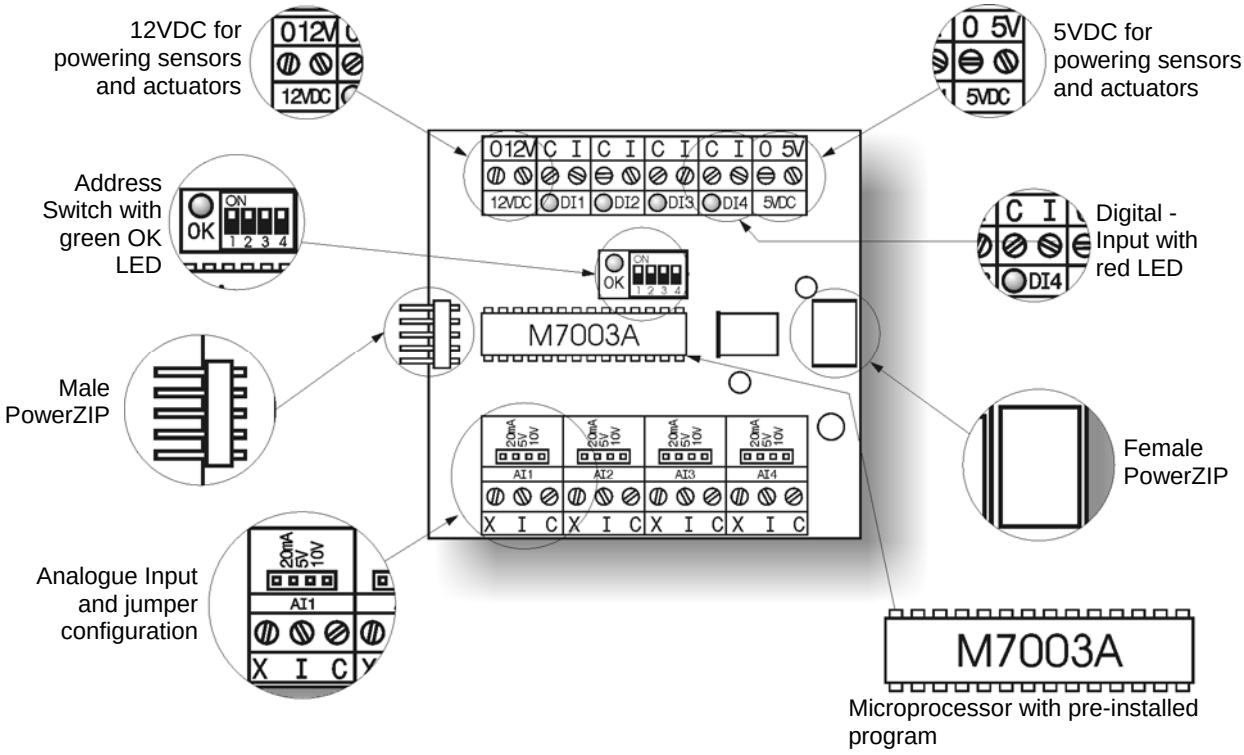
Wire the sensors and actuators to the ZIP Module. The M7003A has 5VDC and 12VDC outputs for powering sensors and actuators. See section '***Inputs***'

Step 6 – Power up ZIP System

When power is re-applied, the green LED beside the address switch should flash on and off to show the module is working properly, and as soon as the master is communicating with the module the LED will remain continuously lit. If the module fails to communicate with the master the LED will continue to flash.

Step 7 – Object Engineering

Use object-engineering software to access your ZIP System master and read the data from your ZIP Module to test that it is functioning correctly.



Address Switch

The Address Switch allows the modules address to set. There are 16 different addresses available, set with different combinations of the 4 switches labelled 1 to 4. Up is on and down is off.

Module Address	Switch Position			
	1	2	3	4
0	Off	Off	Off	Off
1	On	Off	Off	Off
2	Off	On	Off	Off
3	On	On	Off	Off
4	Off	Off	On	Off
5	On	Off	On	Off
6	Off	On	On	Off
7	On	On	On	Off

Module Address	Switch Position			
	1	2	3	4
8	Off	Off	Off	On
9	On	Off	Off	On
10	Off	On	Off	On
11	On	On	Off	On
12	Off	Off	On	On
13	On	Off	On	On
14	Off	On	On	On
15	On	On	On	On

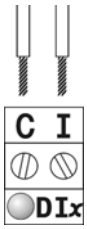
Examples

With the Address Switch set with 1=on, 2=off, 3=on, 4=off, the modules address will be 5.

With the Address Switch set with 1=on, 2=off, 3=off, 4=on, the modules address will be 9.

Digital Inputs

The four digital inputs are labelled DI1…DI4.

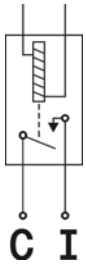


Each digital input is design to connect directly to a volt-free switch. The input reads 'off' when the switch is open, and on when the switch is closed. The digital input's red LED is lit when the input is 'on'. The two terminals are labelled:

- C '*common*'
- I '*input*'

Below are examples of volt-free switches that a digital input could be wired to.

A simple switch that when in the open position the digital input's red LED is off.

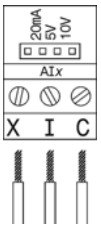


A relay that when not energised the digital input's red LED is off.

An Optocoupler that isolates the digital input from external power supplies.

Analogue Inputs

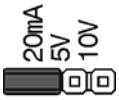
The four Analogue inputs are labelled AI1…AI4.



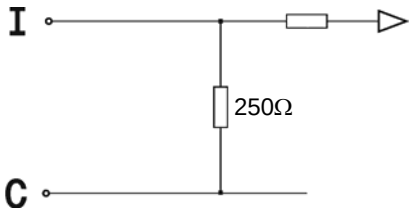
Each Analogue input is design to be configurable. The three terminals are labelled:

- X '*Excitation'*
- I '*input'* (configurable, see diagrams below)
- C '*common'*

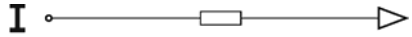
Below are examples of jumper configuration as viewed from the top of the module and diagrams of the circuits created.



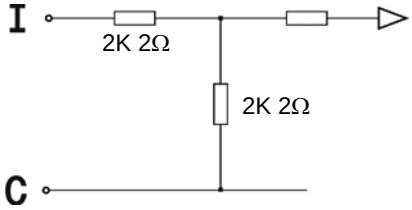
With the jumper on the left two pins the Analogue input will read between 0 and 20mA



With the jumper on the centre two pins the Analogue input will read between 0 and 5VDC

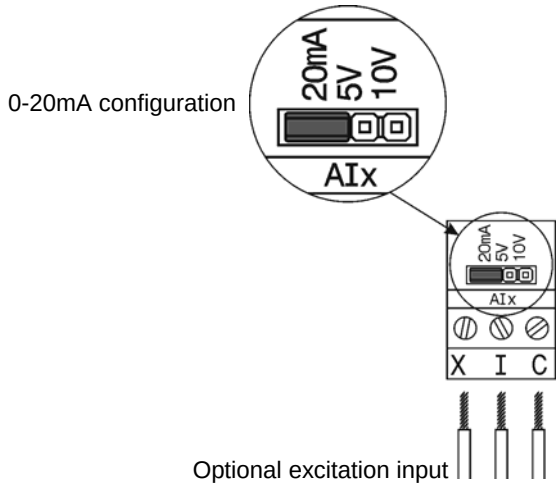


With the jumper on the right two pins the Analogue input will read between 0 and 10VDC

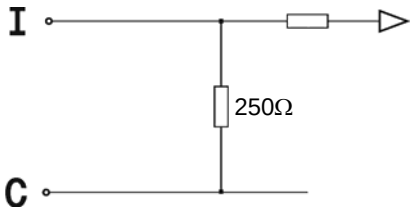


Analogue Inputs (0-20mA)

The four Analogue inputs are labelled AI1…AI4. Each Analogue input is designed to be configurable. To set the analogue input to measure a 0-20mA voltage place the jumper on the two pins on the left.



When the jumper is in the 20mA position the internal connections are shown below.



The three terminals on each Analogue input are labelled:

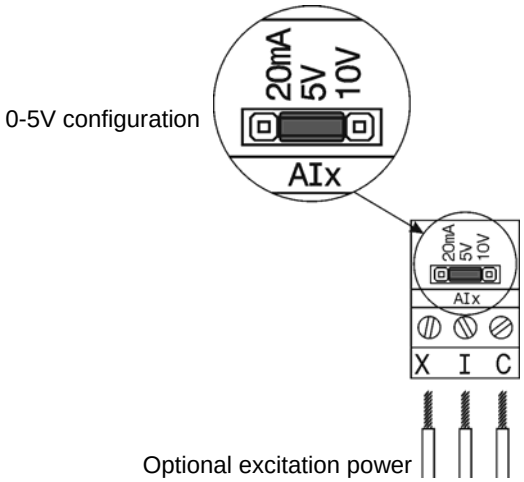
- X '*Excitation'*
- I '*input'* (configurable, see diagrams below)
- C '*common'*

Certain sensors require *'exciting'* for them to operate. The exciting of the sensor should not be confused with applying power. When a sensor requires power to operate it can be supplied either from the ZIP module or the sensor should have its own power supply.

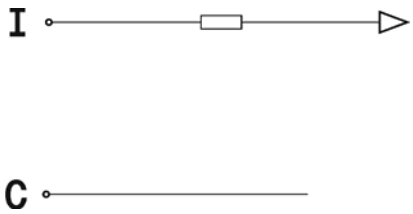
Within the ZIPMaster, the 'Scale 0' reading/value and 'Scale 1' reading/value are used to rescale the 'Input Reading' to produce useful engineering units.

Analogue Inputs (0-5V)

The four Analogue inputs are labelled AI1…AI4. Each Analogue input is design to be configurable. To set the analogues input to measure a 0-5V voltage place the jumper on the centre two pins.



When the jumper is in the 5V position internal connections are shown below



The three terminals on each Analogue input are labelled:

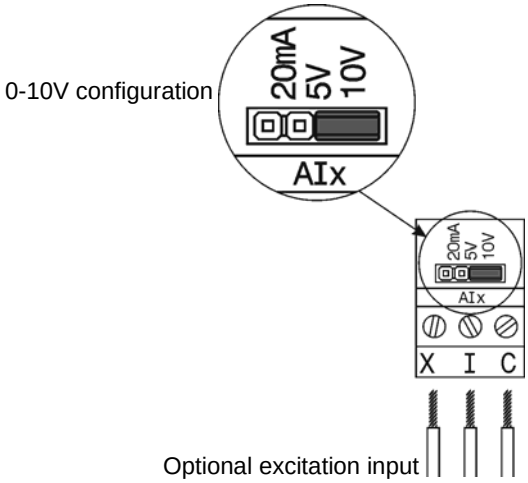
- X '*Excitation'*
- I '*input'* (configurable, see diagrams below)
- C '*common'*

Certain sensors require *'exciting'* (or powering) for them to operate. There is a small amount of regulated power available at the X connector, or you may use external power supplies. If external power supplies are used, ensure that they share the same OV level with the C connector, or use isolation devices.

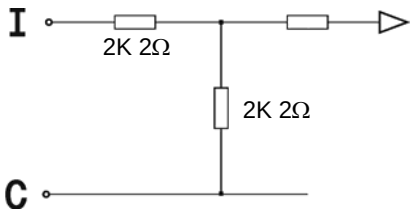
Within the ZIPMaster, the 'Scale 0' reading/value and 'Scale 1' reading/value are used to rescale the 'Input Reading' to produce useful engineering units.

Analogue Inputs (0-10V)

The four Analogue inputs are labelled AI1…AI4. Each Analogue input is design to be configurable. To set the analogue input to measure a 0-10V voltage place the jumper on the two pins on the right.



When the jumper is in the 10V position internal connections are shown below



The three terminals on each Analogue input are labelled:

- X '*Excitation'*
- I '*input'* (configurable, see diagrams below)
- C '*common'*

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